**KFUPM, DEPARTMENT OF MATHEMATICS AND STATISTICS**

MATH 102 : TEST 2, T 171, OCTOBER 15, 2017

Name : ..... ..... .....

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**Exercise 1.** Suppose a particle moves along a straight line with velocity $v(t) = t^2 - 8t + 15$, where $0 \leq t \leq 6$. Find the total distance traveled by the object up to $t = 6$.

**Exercise 2.** Evaluate the integral

$$\int_1^e \frac{\ln(t)}{t\sqrt{1+\ln(t)}}\mathrm{dt}.$$

**Exercise 3.** Evaluate the area of the region enclosed by the curves $y =\mid x \mid$ and $y = x^2$.

**Exercise 4.** Find the volume of the solid obtained by rotating the region bounded by the curves $y = \sin(x)$, $y = 0$ over the interval $[0, \pi]$ about the $x$-axis.

**Exercise 5.** Find the volume of the solid obtained by rotating the region bounded by the curves $y = x^2$ and $y = x^3$ about the line $x = -2$

**Exercise 6.** Let $S$ be the solid with base enclosed by the triangle with vertices $(0, 0), (2, 0)$ and $(0, 3)$. If the cross sections perpendicular to the $x$-axis are semi-circles, then find the volume of $S$.